SLOVENSKI STANDARD
SIST EN IEC 60404-8-1:2023

01-december-2023

Magnetni materiali - 8-1. del: Specifikacije za posamezne materiale - Materiali za permanentne (trdomagnetne) magnete (IEC 60404-8-1:2023)

Magnetic materials - Part 8-1: Specifications for individual materials - Permanent magnet (magnetically hard) materials (IEC 60404-8-1:2023)

Magnetische Werkstoffe - Teil 8-1: Anforderungen an einzelne Werkstoffe - Hartmagnetische Werkstoffe (Dauermagnete) (IEC 60404-8-1:2023)

Matériaux magnétiques - Partie 8-1: Spécifications pour matériaux particuliers - Matériaux (magnétiques durs) pour aimants permanents (IEC 60404-8-1:2023)

Ta slovenski standard je istoveten z: **EN IEC 60404-8-1:2023**

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
29.030	Magnetni materiali	Magnetic materials

SIST EN IEC 60404-8-1:2023 **en**

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60404-8-1

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English Version

Magnetic materials - Part 8-1: Specifications for individual materials - Permanent magnet (magnetically hard) materials (IEC 60404-8-1:2023)

Matériaux magnétiques - Partie 8-1: Spécifications pour matériaux particuliers - Matériaux (magnétiques durs) pour aimants permanents
(IEC 60404-8-1:2023)

Magnetische Werkstoffe - Teil 8-1: Anforderungen an einzelne Werkstoffe - Hartmagnetische Werkstoffe (Dauermagnete)
(IEC 60404-8-1:2023)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of document 68/732/CDV, future edition 4 of IEC 60404-8-1, prepared by IEC/TC 68 "Magnetic alloys and steels" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60404-8-1:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-07-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-10-25

This document supersedes EN 60404-8-1:2015 and all of its amendments and corrigenda (if any).

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The text of the International Standard IEC 60404-8-1:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60404-1:2016 NOTE Approved as EN 60404-1:2017 (not modified)
IEC 60404-7:2019 NOTE Approved as EN IEC 60404-7:2020 (not modified)

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-121	-	International Electrotechnical Vocabulary - Part 121: Electromagnetism	-	-
IEC 60050-151	-	International Electrotechnical Vocabulary - Part 151: Electrical and magnetic devices	-	-
IEC 60050-221	-	International Electrotechnical Vocabulary. Chapter 221: Magnetic materials and components	-	-
IEC 60404-5	2015	Magnetic materials - Part 5: Permanent magnet (magnetically hard) materials - Methods of measurement of magnetic properties	EN 60404-5	2015

IEC 60404-8-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Magnetic materials –

Part 8-1: Specifications for individual materials – Permanent magnet (magnetically hard) materials

Matériaux magnétiques –
Partie 8-1: Spécifications pour matériaux particuliers – Matériaux (magnétiques durs) pour aimants permanents

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MAGNETIC MATERIALS –

Part 8-1: Specifications for individual materials – Permanent magnet (magnetically hard) materials

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 60404-8-1 has been prepared by IEC technical committee 68: Magnetic alloys and steels. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) recently developed anisotropic REFeB hot deformed magnets and anisotropic HDDR REFeB bonded magnets are included;
b) high energy Ca-La-Co ferrites stabilized by La and Co substitution are included;
c) new and high-performance grades of REFeB and RE_2Co_{17} sintered magnets and isotropic REFeN bonded magnets are added.

The text of this International Standard is based on the following documents:

Draft	Report on voting
68/732/CDV	68/742/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60404 series, published under the general title *Magnetic materials*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

This document includes the recently developed REFeB hot deformed magnets, anisotropic HDDR REFeB bonded magnets and high energy Ca-La-Co ferrites which have become established in permanent magnet applications. New and high-performance materials of REFeB and RE_2Co_{17} sintered magnets and isotropic and anisotropic REFeN bonded magnets are added to each table with new codes. Almost all materials added to this document have been used for various motors to save energy and contribute to the prevention of global warming.

MAGNETIC MATERIALS –

Part 8-1: Specifications for individual materials – Permanent magnet (magnetically hard) materials

1 Scope

This part of IEC 60404 specifies minimum values for the principal magnetic properties of, and dimensional tolerances for, technically important permanent magnet (magnetically hard) materials.

For information purposes only, this document provides values for the densities of the materials and the ranges of their chemical compositions.

NOTE Some additional physical data and mechanical reference values concerning the magnetic materials are given in Table A.1 for information and comparison purposes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-121, *International Electrotechnical Vocabulary (IEV) - Part 121: Electromagnetism*

IEC 60050-151, *International Electrotechnical Vocabulary (IEV) - Part 151: Electrical and magnetic devices*

IEC 60050-221, *International Electrotechnical Vocabulary (IEV) - Part 221: Magnetic materials and components*

IEC 60404-5:2015, *Magnetic materials - Part 5: Permanent magnet (magnetically hard) materials - Methods of measurement of magnetic properties*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-121, IEC 60050-151 and IEC 60050-221 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp